

OPERATING SUMMARY

TOWN OF
STURGEON FALLS
WATER POLLUTION CONTROL PLANT

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STURGEON FALLS
WATER POLLUTION CONTROL PLANT

MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

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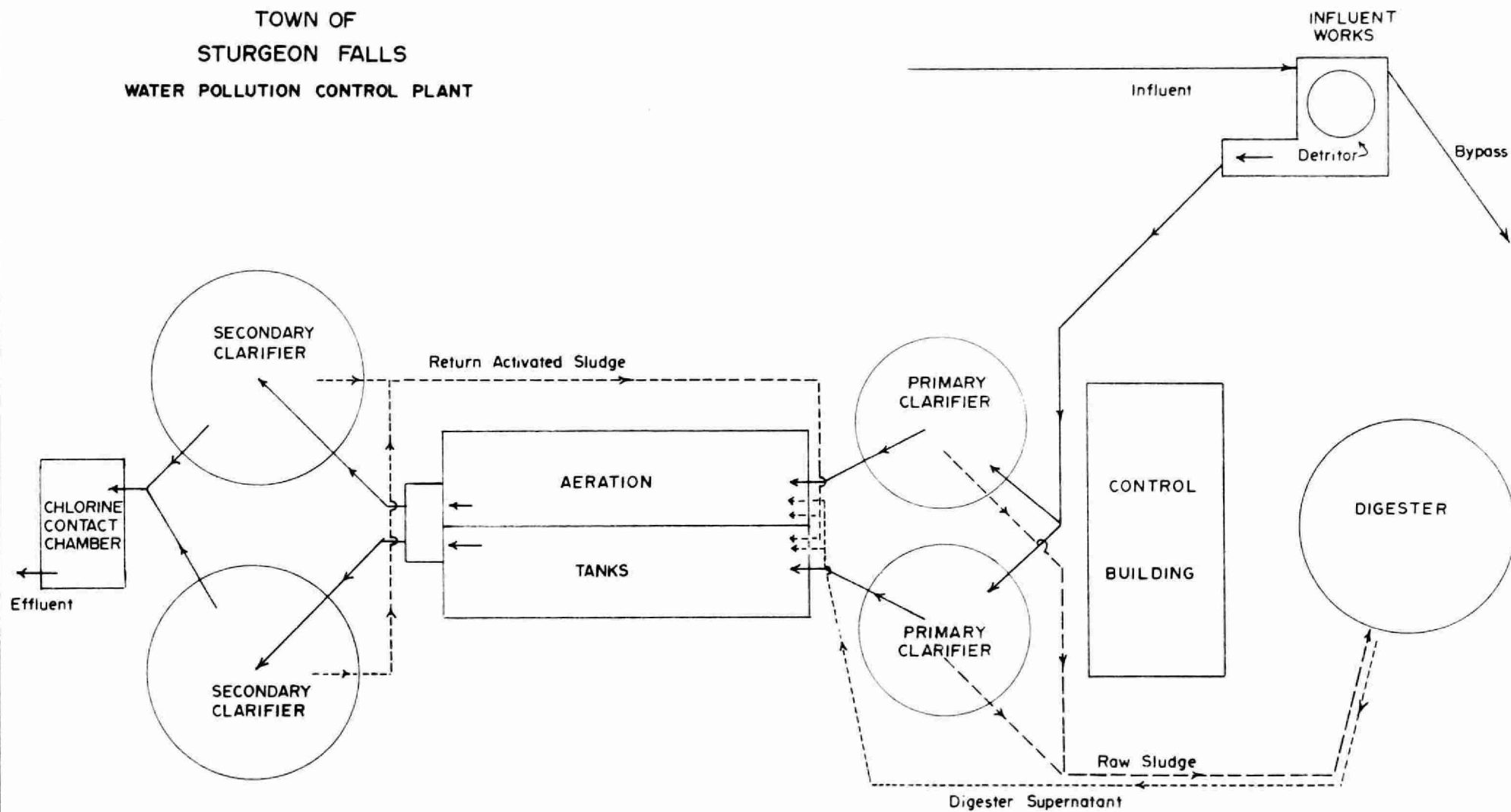
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TOWN OF
STURGEON FALLS
WATER POLLUTION CONTROL PLANT



DESIGN DATA

Project Town of Sturgeon Falls WPCP

Project No: 1-0012-66
Treatment: Conventional Activated Sludge
Design Flow: 1 MGD
BOD: Raw Sewage 180 mg/l
SS: Raw Sewage 200 mg/l

PUMPING STATIONS:

Two, prefabricated, each with 1250 IGPM pump
One, built in place, with DUPLEX Submersible
375 IGPM Pump

PRETREATMENT

DETRITOR:

One, 12' dia. x 1.6' awd
Volume: 1100 I. Gal Detention: 1.6 min.

COMMINUTOR:

Capacity: 4 MGD

BAR SCREENS:

in channel, after comminutor

PRIMARY CLARIFIERS:

Two, 36' dia. x 10' swd
Volume: (total) 127,000 I. Gal.
Detention: 3.0 hours
Overflow rate: 490 I. Gal/ft²/day

AERATION TANKS:

Two, 42' x 18' x 14' swd
Volume: (total) 132,000 I. Gal.
Detention: 3.2 hours
Blowers: two, each 4320 cfm

SECONDARY CLARIFIERS:

Two, 36' dia. x 10' swd
Volume: (total) 127,000 I. gal.
Detention: 3.0 hours
Surface overflow rate: 490 gal/ft²/day.

DIGESTER:

45' dia. x 20' swd
Volume: 31800 ft³

CHLORINE CONTACT CHAMBER:

Four passes, each 16' x 6.2' x 11.75' swd (avg)
Volume: 29000 I. Gal. Detention: 42 min.

'74 Review

GENERAL

This project consists of a conventional activated sludge plant with single stage digestion and three sewage pumping stations.

Construction of the project was substantially completed in October, 1973, and 1974 was the projects first full year of operation. The plant has a design flow capacity of 1.0 million gallons per day.

Phosphorus removal treatment to reduce the phosphorus level in the sewage to 1.0 mg/l as P or effect 80% removal of total phosphorus will be implemented in 1975.

The project is operated by a chief operator and an operator and is manned 8 hours a day during the regular work week and 4 hours a day on the weekend.

The major problem with the project in 1974 was high hydraulic loading caused by storm water and infiltration entering the sanitary and combined sewers. This over-loaded the #1 River St. pump station on numerous occasions and resulted in 182 hours of by-passing to the river during the year.

In order to alleviate the hydraulic surging to the plant, variable speed pumping was installed at the main pump station to insure a more uniform flow. However, the motor was found to be defective and was returned to the supplier. The motor will be replaced in 1975 by another type.

OPERATING COSTS

The total operating costs for the year was \$65,126. The average cost per million gallons of sewage treated was \$141.

PLANT FLOWS AND CHLORINATION

The total sewage flow treated during 1974 was 461.5 million gallons which represents an average flow of 1.26 mgd. The high hydraulic loading which represents 126% of plant design flow capacity is due to combined sewers and infiltration into the sanitary sewers. The town will begin a sewer separation program in 1975 in order to reduce the hydraulic loading to the plant.

The per capita average daily sewage flow for the year based on a serviced population of 6200 persons was 203 gallons.

The effluent was chlorinated for the entire year and a total of 10,828 pounds was used representing an average chlorine dosage of 2.3 mg/l.

PLANT EFFICIENCY

The raw sewage BOD and suspended solids concentration averages were 68 mg/l and 108 mg/l respectively.

The final effluent BOD average was 8 mg/l and the final effluent suspended solids average was 16 mg/l. The total organic loading to the plant in 1974 was 313,820 pounds BOD and 498,420 pounds suspended solids. Of these totals 276,900 pounds of BOD and 424,580 pounds suspended solids were removed by the treatment process, representing a removal efficiency of 88 percent and 85 percent respectively.

AERATION

The average BOD concentration of 48 mg/l to the aeration section resulted in an average organic loading of 28.57 pounds BOD per 1000 cubic feet of aeration tank capacity. The mixed liquor suspended solids concentration averaged 2,100 mg/l and the F/M ratio averaged 0.30.

SLUDGE DIGESTION AND DISPOSAL

A total of 679,000 gallons of raw sludge was pumped to the single stage anerobic digester during the year. The average total solids concentration of the sludge was 5.7%.

A total of 51,386 gallons of raw and 585,468 gallons of digested sludge with a total solids concentration of 3.6 percent were hauled by tank truck from the plant to a sand pit disposal site in Caldwell Twp during 1974.

A total of 1194 cubic feet of grit was removed from the plant in 1974 representing 2.6 cubic feet per million gallons of sewage treated. The large amount of grit reaching the plant is due to sand entering through the combined sanitary/storm sewer system.

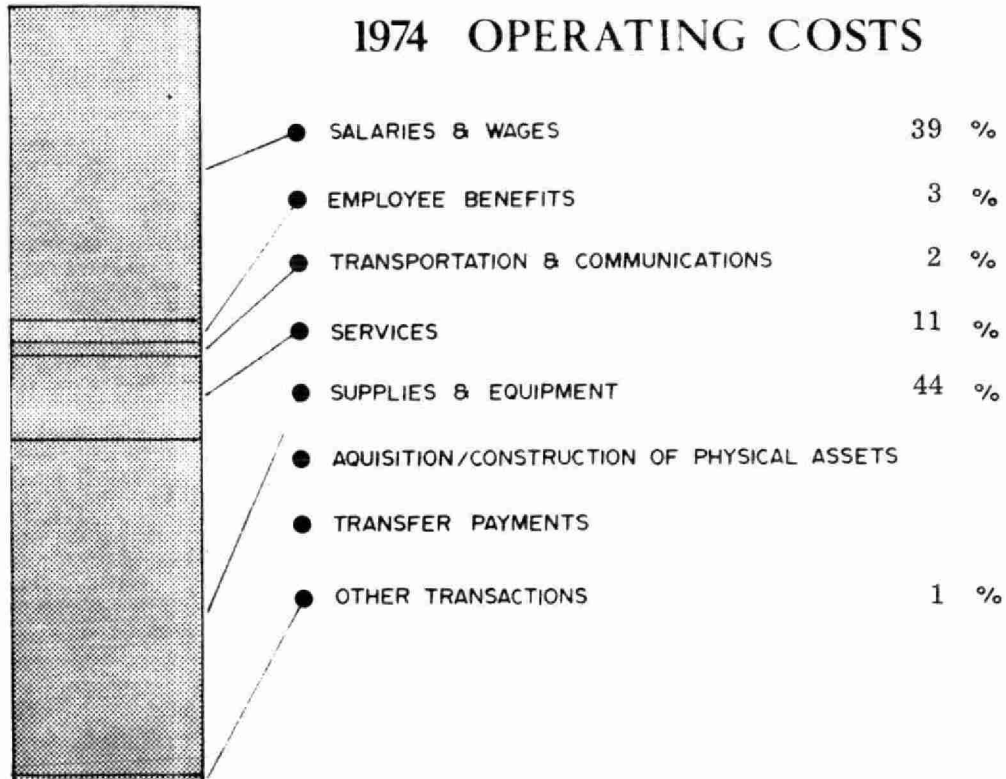
CONCLUSION

The water pollution control plant produced a good quality effluent in 1974 despite the high hydraulic loading of 126 percent of the design capacity. It is expected that this problem will be partially solved with the initiation of a sewer separation program and repairs to defective sewers in 1975.

Phosphorus removal treatment will be implemented in 1975.

ANNUAL COSTS

1974 OPERATING COSTS



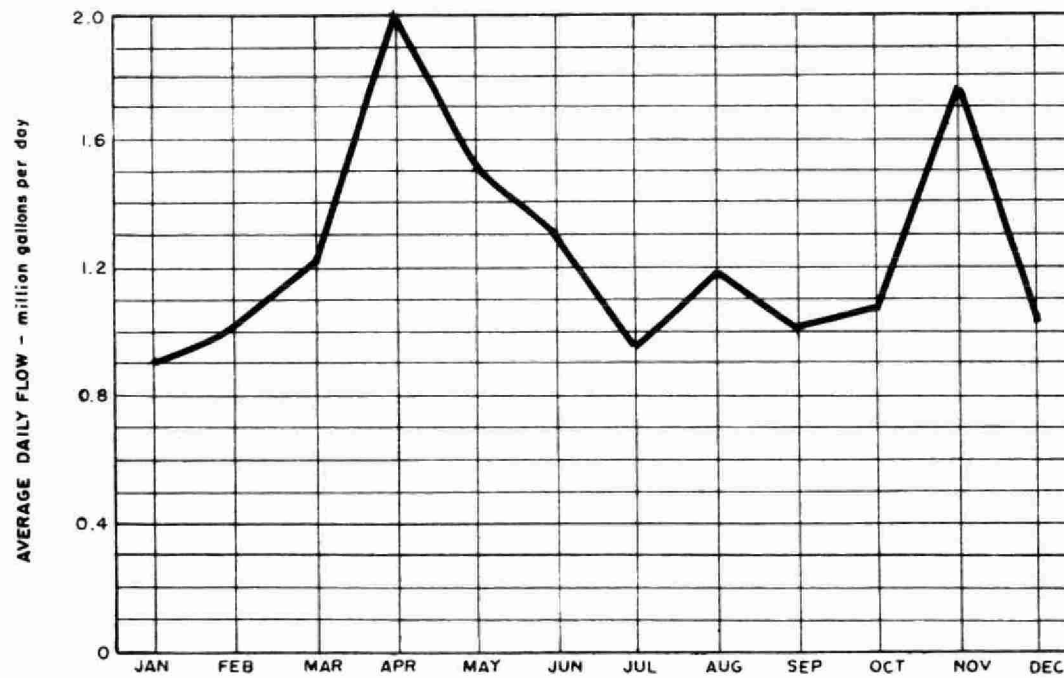
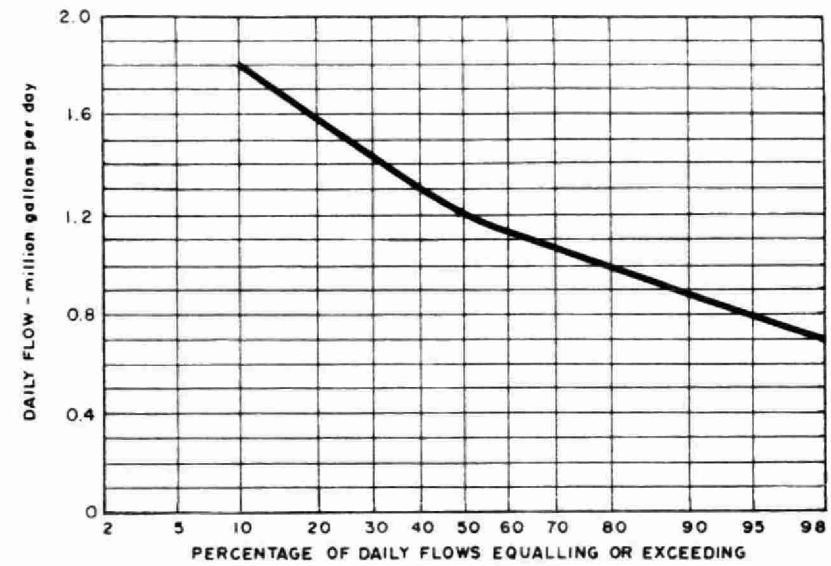
YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS	
			\$/M G	£/lb BOD
1974	461.5	65,126	141	24

OPERATING EXPENDITURES

Regular Staff	\$ 22,447	\$
Casual (Unclassified) Staff	3,136	
TOTAL SALARIES AND WAGES		25,583
TOTAL EMPLOYEE BENEFITS		2,125
TOTAL TRANSPORTATION AND COMMUNICATIONS		1,450
Insurance	918	
Sludge Haulage	4,484	
Repairs and Maintenance	1,338	
Other Services	485	
TOTAL SERVICES		7,225
Machinery and Equipment	7,194	
Chemicals	3,622	
Utilities	13,575	
Other Supplies and Equipment	3,477	
TOTAL SUPPLIES AND EQUIPMENT		27,868
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		-
TOTAL TRANSFER PAYMENTS		-
OTHER TRANSACTIONS		875
GRAND TOTAL	GRAND TOTAL	\$ 65,126

PROCESS DATA FLOWS

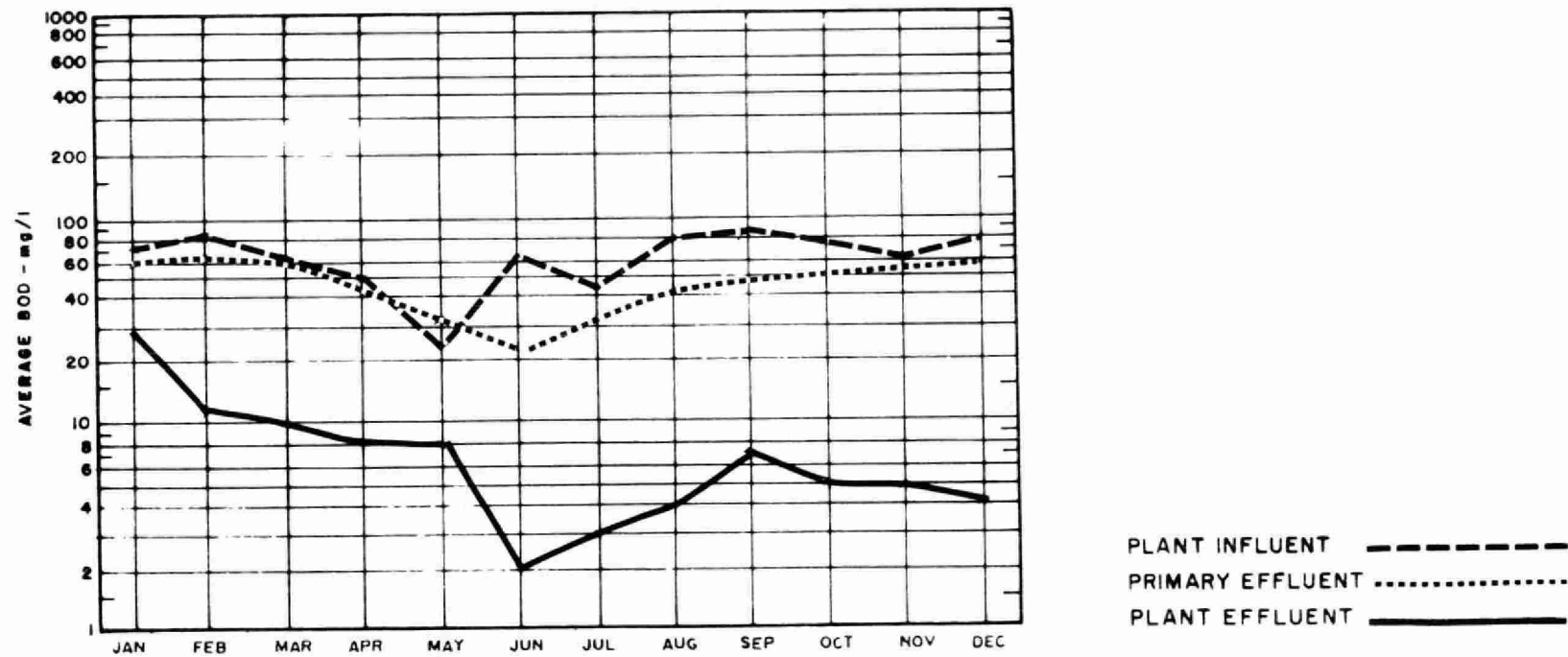
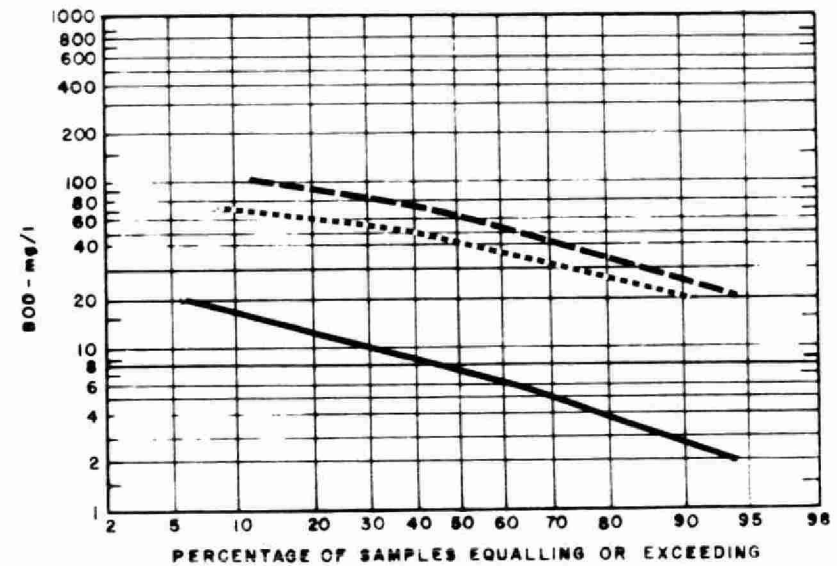


DESIGN CAPACITY — — — — —

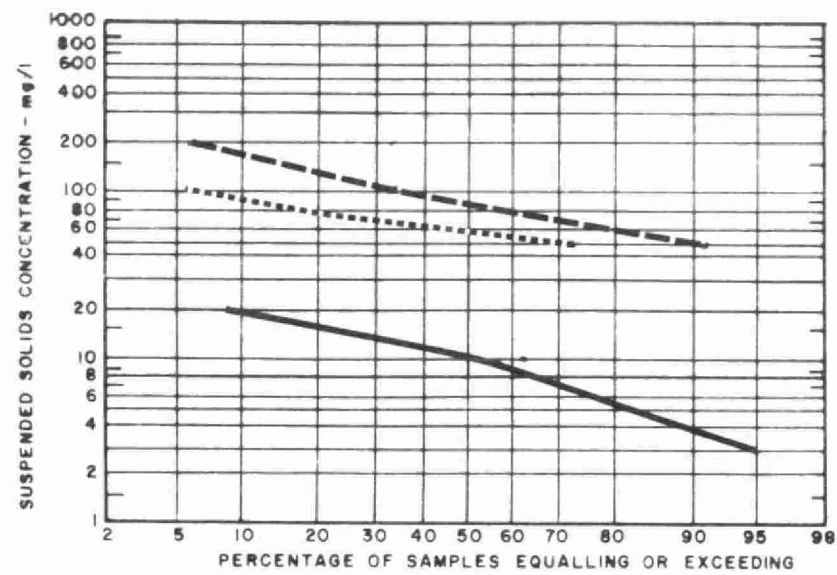
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN	28.2	.91	1.60	75	28	63	13.3	120	13	89	30.2	5.2	1.4
FEB	28.3	1.01	1.84	85	12	86	20.7	83	11	87	20.4	3.6	2.0
MAR	40.1	1.29	3.93	65	10	89	22.1	93	16	83	30.9	3.1	1.1
APR	60.7	2.02	4.28	50	8	84	25.5	73	26	64	28.5	2.7	1.1
MAY	46.4	1.50	2.45	24	8	67	7.4	71	12	83	27.3	2.1	.9
JUNE	40.0	1.30	2.30	65	2	97	25.2	111	11	90	40.0	4.5	3.2
JULY	29.4	.95	1.29	44	3	93	12.1	114	11	90	30.3	4.3	2.1
AUG	36.9	1.19	2.01	80	4	80	28.0	142	27	81	42.4	4.6	2.5
SEPT	30.4	1.01	1.51	83	7	92	23.1	93	15	84	23.7	5.2	2.9
OCT	36.2	1.17	1.64	78	5	94	26.4	70	13	81	20.6	4.3	1.9
NOV	52.5	1.75	3.10	60	5	92	28.9	87	9	90	41.0	3.5	1.2
DEC	32.4	1.04	1.50	80	4	95	24.6	105	10	90	30.8	4.5	1.9
TOTAL	461.5	-	-	-	-	-	258.9	-	-	-	424.6	-	-
AVG.		1.26	MAXIMUM 4.28	68	8	88	21.5	108	16	85	35.3	3.9	1.8
No. of Samples	-	-	-	16	16	-	-	202	197	-	-	15	15

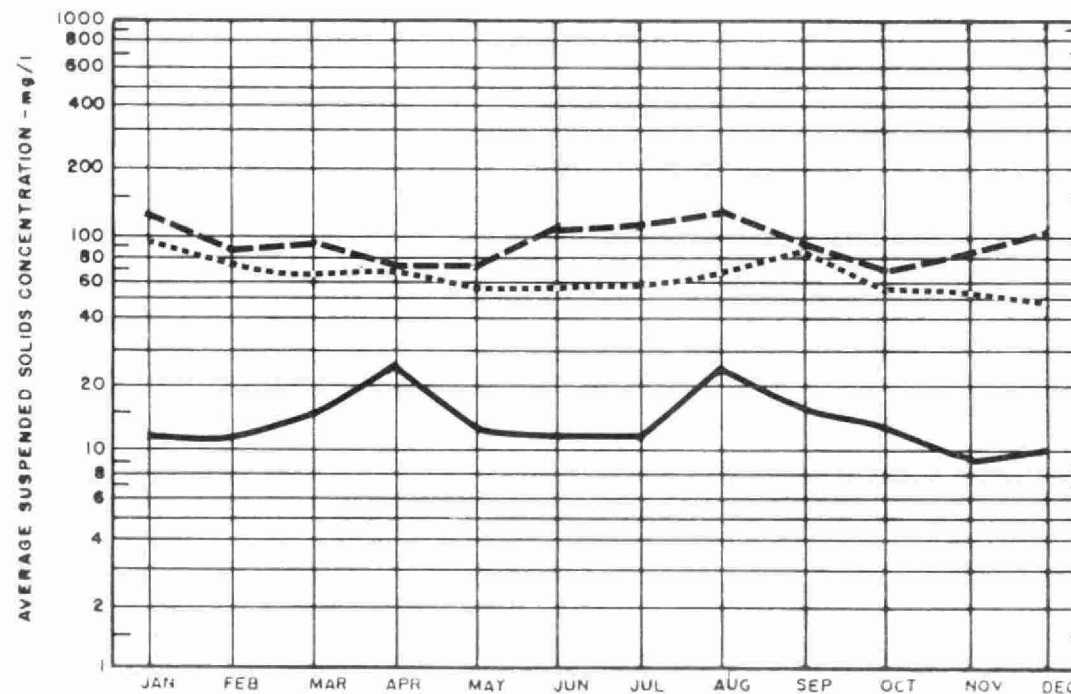
BIOCHEMICAL OXYGEN DEMAND



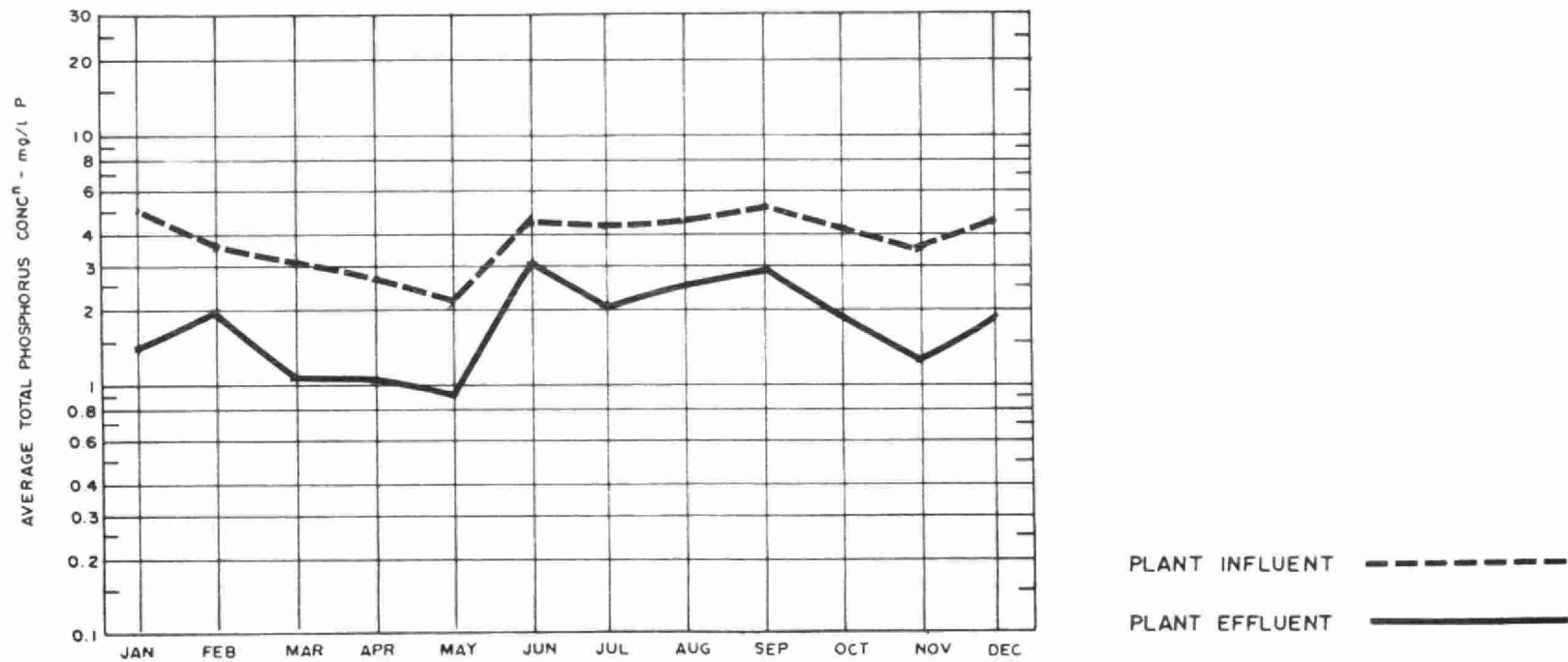
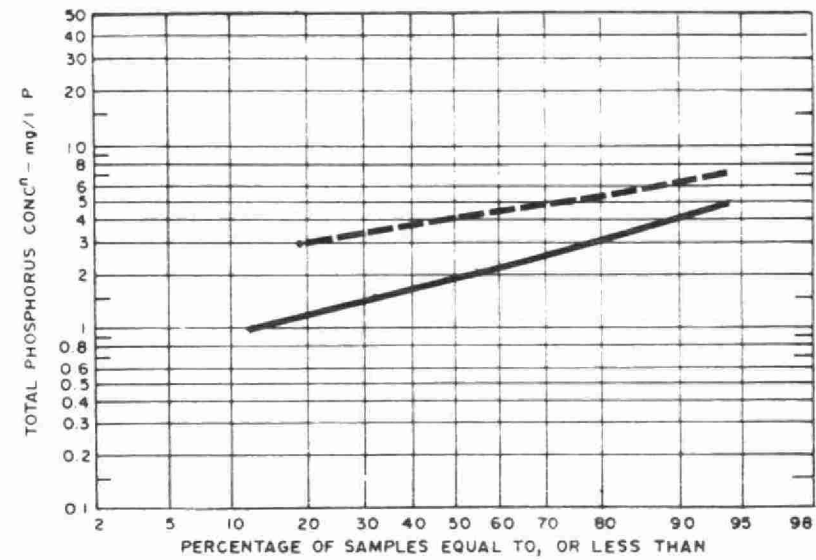
SUSPENDED SOLIDS



PLANT INFLUENT 
 PRIMARY EFFLUENT 
 PLANT EFFLUENT 



PHOSPHORUS



TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED pounds	AVG DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T.S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL SOLIDS %	QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL SOLIDS %		
JAN	30	571	2.0	60	92	2400	.20	.4	83	4.3	78	3.2	3.5	65	1.4	309
FEB	32	678	2.8	65	75	3400	.17	.2	10	5.7	74	21.5	5.5		.9	142
MAR	97	791	2.0	60	60	1900	.37	.2	50	7.5	61	36.8	2.8	56	1.8	218
APR	306	811	1.3	44	72	2400	.33	.2	55	9.6	49	61.3	4.8	37	1.8	364
MAY	78	770	1.7	34	55	1800	.26	.4	57	5.2	62	62.8	3.1		1.6	373
JUNE	171	1005	2.5	22	59	1700	.15	.6	55	5.7	58	61.2	3.3		1.8	364
JULY	34	1106	3.7	34	60	1400	.22	.5	70	5.0	62	61.2	3.0		1.6	364
AUG	160	1205	3.3	46	65	1800	.28	.3	62	7.8	50	46.0	3.4	53	1.7	273
SEPT	75	1043	3.4		85	2300			54	4.2	56	46.0	3.7	44	1.2	273
OCT	106	1059	2.9		53	2500			59	5.0	63	55.0	3.5	50	1.3	336
NOV	56	1007	1.9	55	53	1700	.57	.2	64	5.2	62	67.4	3.4		1.7	400
DEC	49	782	2.8	60	48	1300	.44	.3	60	3.5	69	61.4	2.9		1.9	364
TOTAL	1194	10828	-	-	-	-	-	-	679	-	-	583.8	-	-	-	3780
AVG.	2.6 cu. ft/mil gal	902	2.3	48	65	2100	.30	.3	57	5.7	62	48.7	3.6	51	1.6	315



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